DRAFT/October 2000

Metrology in Support of Trade

What are "Metrology" and "Calibration"?

Metrology is the science of measurement. Rapid and highly accurate measurements are critical to modern commerce. Companies seek greater efficiencies by controlling quantity and quality variables, such as tolerance or fit, using new measurement devices, technologies and measuring features. This has led to increased demands on the commercial measurement system. Regulators specify criteria and test methods for detecting and measuring product attributes which affect health, safety or the environment; ranging from gas or electromagnetic emissions to pesticide residues. This requires manufacturers to have access to measurement technology that can support regulatory compliance. Both industry and regulators want to be sure that the measurements on which they rely are accurate, so that they can be confident in the results obtained.

Precision instruments must be calibrated periodically in order to assure continued measurement accuracy and quality. Calibration involves measuring a specific known quantity (standard) with the instrument in question, comparing the result obtained with the actual value, and determining the deviation from the standard in order to identify appropriate correction factors (measurement uncertainty).

Why are These Activities Important to Trade?

Tests and measurements play an important role in both commercial transactions and trade, for industry and regulators alike. Industrial customers and regulators will not accept product tests and measurements verifying conformance to contract or regulatory requirements unless they are confident that the underlying physical measurement standards are valid. Product-testing protocols increasingly require measurements that are directly related to the importing nation's national standards or those recognized as being equivalent.

In many cases, product tests and associated measurements refer to underlying physical measurement standards realized and maintained by National Measurement Institutes (NMIs). NMIs in the United States and Europe are legally responsible for developing, maintaining and disseminating national measurement standards, making them available to industry, government agencies, and the public; they are not, however, required to establish equivalence of national standards with other countries, although some do undertake this responsibility as well.

What is the Impediment to Trade?

Failure to recognize the equivalency of tests and measurements forces manufacturers to retest their products for multiple markets, adding additional costs and time to bring products to

market. The current lack of recognition between the U.S. and the EU gives rise to impediments to trade, such as failure to accept calibration and measurement certificates issued by laboratories in the exporting country; duplication of tests, measurements and assessments; and lack of understanding of how to handle measurement-related issues. For example, several U.S. and EU laboratories and manufacturers have indicated that the need to recalibrate test equipment due to different requirements in the U.S. and EU has led them to maintain two sets of testing equipment for what is basically the same operation. This translates into additional testing costs of between 30-40 percent, which are prohibitive to many potential exporters, particularly small and medium sized enterprises. Lack of recognition of measurements has impeded trade in certain sectors, e.g. aviation, pressure vessels, and motor vehicles (exhaust emissions). In the aviation sector, Federal Aviation Administration (FAA) regulations require that aircraft repair station equipment be calibrated at specified intervals, to ensure accurate measurements, and that calibration artifacts used must be traceable to NIST. In the motor vehicle sector, each Party has different requirements for verifying the accuracy of exhaust emissions tests, leading to the situation where test results submitted to a regulator in one Party are not recognized by regulators in the other Party.

What is the Framework for U.S.-EU Cooperation and What are the Intended Benefits?

The framework establishes the policy basis for a joint technical program of work between the United States and the European Union to support mutual recognition of test reports, calibration and measurement certificates provided for regulatory compliance purposes. The goal of the proposed work program is both to improve regulatory efficiencies and to facilitate trade. Trade facilitation will be achieved by reducing unnecessary costs and burdens related to conformity assessment due to duplicative measurements, tests and calibration requirements. Increased regulatory efficiencies will be supported by improving regulator confidence in measurements, tests and calibrations performed by qualified laboratories in both the United States and the European Union. Regulatory cooperation activities are critical to this confidence-building.

How Will the Framework Help Address Impediments?

Mutual recognition of measurement standards between the United States and the European Union (EU) would facilitate acceptance of the results of conformance testing or product certification performed by manufacturers, testing laboratories or certification bodies in the United States and the EU in key sectors where measurement comparability is important. Participation in measurement intercomparisons is critical in assuring that one Party will not reject products exported by the other Party simply because they disagree on the methods used to perform a measurement or test. As new technologies emerge and world economies grow, the number, frequency and coverage of such comparisons is rising rapidly. Sound, accurate and reliable measurements, be they physical, chemical or biological in nature, are therefore essential.

While physical measurements are realized and maintained at the highest level by NMIs in the United States and the EU, most tests and measurements in support of trade are performed by commercial laboratories, not by NMIs. Thus it is important to address both mutual recognition of the measurement capability of NMIs and the measurement capabilities of calibration and testing laboratories whose work is traceable to national measurements.